ABSTRACT

Population studies of the pigeonpea pod borer, *Ancylostomia stercoraela* (Zeller) (Lepidoptera:Pyralidae) and relations to its parasitoids and host plant, *Cajanus cajan* (L.) Millsp.

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Six parasitoids were found to attack the egg and larval stages of *A. stercoraela*, the braconids *Apanteles etiellae isolatus*, *Bracon cajani*, *B. thurberiphagae* and *Phanerotoma bennetti*, the bethylid, *Goniozus punctulaticeps*, and the ichneumonid, *Eiphosoma annulatum*. Pupal diapause in *A. stercoraela* was demonstrated and control of this stage was an important component of an integrated programme for the pod borer.

The population parameters, mean generation time (*T = 42.15 days*), intrinsic (*r_m = 0.108*) and finite rate of increase (*λ = 1.11*), mean fecundity (*34.71 ± 0.23*) eggs per female and net reproductive rate (*R_o = 94.81*) were estimated for *A. stercoraela*.

Analysis of temporal distribution of the eggs of *A. stercoraela* over two years showed regular cyclical patterns coinciding with the flowering of the host plant. *A. stercoraela* egg distribution was best described by Taylor’s Power Law (*b = 1.26*) and Iwao’s Regression (*β=1.41*) both
indicating aggregation. A sequential sample table based on the egg stage was constructed for use in the field.

Life tables prepared for *A. stercorea* were analysed using conventional key factor analysis and the newer multiple decrement life table approach. Fourth 

\( (k_4) \) and fifth instar mortality 

\( (k_5) \) as well as adult mortality 

\( (k_7) \) were identified as the key mortality factors. The multiple decrement approach revealed that an average of 33.9% mortality occurred in all stages.

Life tables were also prepared for pigeonpea and similar analyses conducted. Mean bud, flower and pod abscission during the entire season was 

\( (30.4 \pm 4.4\%) \); 

\( (59.5 \pm 4.5\%) \) and 

\( (10.1 \pm 2.5\%) \) respectively. The key factor was identified as 

\( k_3 \) (pod I) mortality), whereas the regulating factor was 

\( k_2 \) (flower mortality). Multiple decrement life table analysis revealed that natural factors alone accounted for the major mortality (67.56%) from bud to pod (V) stage during the entire season.

Comparison of insecticides between pest and parasitoids showed that malathion, fenvalerate and decamethrin were good candidates for the protection of *A. etiella isolatus*, *B. cajani* and *B. thurberiphagae* while causing high mortality to *A. stercorea*. 